



AUTOMATED MICRO-PIPETTE SYSTEM



The Environmental Measurements Laboratory designed micro-pipette system delivers a highly accurate volume of solution in a programmable pattern. The system was designed to spike filter samples for the EML Quality Assessment Program (QAP), a performance evaluation program for environmental radiological analysis administered for the U.S. Department of Energy, Office of Environmental Management. Simulated air filters are prepared by pipetting twelve calibrated drops of a standard radionuclide solution in two concentric circles on a 7 cm glass fiber (Whatman 541) filter.

Modular design, assembled with commercially available components, delivers a repeatable amount of liquid to precise locations.

Dispensing Mechanism

- ▲ The system provides highly accurate ($\pm 1\%$) dispensing of small volumes (maximum 25 μL)
- ▲ Consistent, repeatable ($\pm 0.01 \mu\text{L}$) ejection of fluid
- ▲ Digital control of volume and rate of the liquid dispensed
- ▲ Ceramic elements are non-reactive with dilute acid solutions and require minimal maintenance

Positioning Mechanism

- ▲ Light weight, compact assembly allows positioning accuracy to within 0.2 mm (0.04 mm optional)
- ▲ Stepping motors control linear and rotational motion of the table. The pipette remains stationary, avoiding inconsistencies in delivery
- ▲ Software allows user developed custom design of liquid delivery pattern



Programmable Electronic Control

- ▲ Embedded computer links and controls the dispensing and the positioning mechanisms
- ▲ Programming done in BASIC
- ▲ Extensive digital/analog inputs and outputs are available to accommodate additional requirements